

## CLAIMS

1. A porous inorganic membrane comprising at least one inorganic phase having separating properties, characterized in that it has a carbon content representing 0.05% to 25% by weight with respect to the mass of said inorganic phase and in that the carbon is distributed in the porosity in a graduated manner.
2. A porous inorganic membrane according to claim 1, characterized in that it has a carbon content representing 0.1% to 10% by weight with respect to the mass of said inorganic phase.
3. A porous inorganic membrane according to claim 2, characterized in that it has a carbon content representing 1% to 8% by weight with respect to the mass of said inorganic phase.
4. A porous inorganic membrane according to one of claims 1 to 3, characterized in that it is selected from zeolitic membranes, modified zeolitic membranes, aluminosilicate membranes, silica membranes, alumina membranes and composite membranes.
5. A porous inorganic membrane according to one of claims 1 to 4, characterized in that it is supported.
6. A porous inorganic membrane according to one of claims 1 to 5, characterized in that it has a pore size that is strictly less than 2 nm.
7. A porous inorganic membrane according to one of claims 1 to 5, characterized in that it has a pore size in the range 2 to 50 nm.

8. A process for preparing a porous inorganic membrane according to one of claims 1 to 7, comprising a step a) consisting of bringing a porous carbon-free inorganic membrane comprising at least one inorganic phase having separating properties into contact with a hydrocarbon feed at a temperature in the range 20°C to 550°C, followed by a step b) consisting of bringing the membrane from step a) into contact with a hydrocarbon feed at a temperature in the range 20°C to 550°C with the provision that in step (a) the hydrocarbon feed contacts the inorganic membrane at higher flow rate than in step (b).
9. A preparation process according to claim 8, in which said hydrocarbon feed is selected from olefins, polyolefins, acetylenes, polyacetylenes, aromatics, polyaromatics, molecules containing one or more aromatic nuclei with one or more hydrocarbon chains, hydrocarbon molecules containing heteroatoms and hydrocarbon molecules containing functionalized groups.
10. A preparation process according to claim 8 or claim 9, in which each of steps a) and b) is carried out at a constant temperature.
11. A preparation process according to claim 8 or claim 9, in which steps a) and b) are carried out using a non isothermal thermal program.
12. Use of a membrane according to one of claims 1 to 7 or prepared according to one of claims 8 to 11 in separating non-condensable molecules with dimensions of less than 0.8 nm contained in a hydrocarbon feed.

13. Use according to claim 12, in which said non-condensable molecules are selected from hydrogen, oxygen, helium, nitrogen, hydrogen sulphide  $\text{H}_2\text{S}$ , carbon monoxide  $\text{CO}$ , carbon dioxide  $\text{CO}_2$  and methane.
14. Use of a membrane according to one of claims 1 to 7 or prepared in accordance with one of claims 8 to 11 in association with at least one catalyst.
15. Use according to claim 14, in hydrocarbon hydroconversion reactions.
16. Use according to claim 14, in oxidation reactions.